Pacific Fisheries Resource Conservation Council

Annual Report 2002- 2003

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Conseil pour la conservation des ressources halieutiques du pacifique

August 2003

Hon. John van Dongen
Minister of Agriculture, Food & Fisheries
Government of British Columbia
Victoria

Hon. Robert Thibault
Minister of Fisheries & Oceans Canada
Government of Canada
Ottawa

Dear Ministers:

This fifth annual report of the Pacific Fisheries Resource Conservation Council is submitted to you and all British Columbians. In line with our mandate, we are reporting on our perspectives on the status of salmon stocks and habitat during the past fiscal year from April 2002 to March 31, 2003.

Our task as a Council has been to provide analysis, observations and recommendations that will enable the safeguarding and sustainable use of Pacific salmon and steelhead stocks and their freshwater and ocean habitat in the province of British Columbia.

This year's report marks a departure from the Council's previous format. We are now submitting briefer annual reports that summarize our current perspectives and recommendations. Other reports issued throughout the year will provide in-depth salmon stock information and analysis and explain our work in consolidating data and historical trends. We will continue to issue background papers and advisories on our priority issues on other occasions throughout the coming years. By changing our approach, we hope to make information and analysis available that is not otherwise readily accessible to enable British Columbians to understand the status and prospects of Pacific salmon stocks. We will also begin reporting annually in 2004 on a calendar year basis, instead of the fiscal year.

This report builds on last year's annual report when we set our focus on salmon stocks in the southern portion of the province. In this year's report, we are summarizing the advice we have provided on the current set of issues that have been of particular concern to us. We intend to issue a background paper and advisory later this year on salmon stocks and habitat in the northern and central coast portions of the province.

Salmon and steelhead stocks in many areas across the province have shown declines during periods in the past decade, although improvements in returns and spawning success have been noted lately in particular locations. While there have been obvious causes for some of the declines, others are more elusive and give rise to what are, at best, just educated guesses. For instance, some Georgia Strait coho populations are still so low that they are at risk of extinction. Only limited progress has been made towards understanding some of the causes of the collapse of these once-valuable and productive populations. The findings to date suggest that the collapse was a result of changes in food sources and productivity, somehow related to ocean climate. Increasingly, it appears that these changes may be directly related to the abundance of plankton species and size ranges preferred by feeding juvenile salmon. The abundance of the plankton, in turn, is related to ocean climate, among other conditions. In contrast, it is without question that mixed-stock fisheries on fall-run sockeye led to excessively high fishing mortality for the Cultus Lake run, as this stock cannot sustain a fishing pressure to the extent that others are able. The overfishing, likely combined with impacts to its habitat, led to this stock's Endangered designation.

In previous annual reports, the Council recommended improvements in salmon stock conservation and assessment, and in habitat protection and restoration. Not enough has been done to advance the state of knowledge in the measurement of stock status and measurement of salmon productivity. In habitat protection and restoration, British Columbia may be continuing to lose its overall capacity to maintain the water quantity and quality conditions essential for salmon, and to provide sufficient safeguards and resources for salmon recovery. The Council notes the lack of information from the governments on trends in the magnitude and quality of fish habitat

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The Council has called for a precautionary approach in salmon farming and salmon enhancement, such as hatchery production, in order to lessen the impacts on the wild salmon populations and reduce the risk to their productive potential. The need for this approach is especially relevant in light of the lack of solid information about the exposure or vulnerability of wild salmon in coastal areas. So little is known about the coastal ecosystems and that phase of the salmon lifecycle, it is difficult to assess the levels of risk, except to observe the apparent relationship to poor returns of salmon in many instances. The interaction of salmon and competition for feeding are matters that require more intensive study in order to identify how risks to wild salmon occur and how they can be minimized. In contrast, there is no question that enhancement of particular stocks increases the chance of overfishing of other, unenhanced stocks in mixed-stock fisheries.

The Council devoted attention and resources to the issues of salmon aquaculture as they relate to wild salmon, and has encouraged more productive public dialogue on the several controversies that have arisen over fish farming. The involvement of the Council in helping to establish an effective Salmon Aquaculture Forum is intended to enable the First Nations, industry and other stakeholders to begin addressing the issues in constructive ways.

There was a marked increase during the past year in the Council's activity and output of reports, advisories and public information, all achieved without any increase in expenditure. The public profile of the Council rose significantly, as measured by the increase in media coverage and visits to the Council's website. It has been satisfying to note the value that ministers and senior government officials have placed on the Council's advice, as well as the stakeholder and public endorsement of the innovative salmon conservation measures the Council has put forward.

It has been a pleasure and privilege for me to work with a Council comprised of capable and devoted members: Mark Angelo, Mary-Sue Atkinson, Frank Brown, Murray Chatwin, Merrill Fearon, Paul LeBlond, Jeff Marliave, Marcel Shepert, Carl Walters, Dick Beamish (ex-officio) and Arnie Narcisse (ex-officio).

During the Council's consultation session in Victoria last year, one of the stakeholders suggested that too many people seem to have given up hope for the future of wild salmon. The prevalence of bad news in the media may be leading to a mistaken belief about a dim outlook for wild fish. This Council does not share that pessimistic view of the future of British Columbia's salmon. A concerted effort can make the difference to ensure that salmon stocks are restored and protected, at the same time as fishing opportunities are facilitated. The critical decisions about the fisheries must be made in a cooperative and constructive process involving the public interest, not in a battleground of interests with each trying to grasp a piece of the resource.

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Chairman

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Pacific Fisheries Resource Conservation Council
Conseil pour la conservation des ressources halieutiques du pacifique

Août 2003

L'hon. John van Dongen
Ministre de l'Agriculture, de
l'alimentation et des pêches
Gouvernement de la Colombie-Britannique
Victoria

L'hon. Robert Thibault
Ministre des Pêches et Océans
Gouvernement du Canada
Ottawa

Messieurs les ministres,

Ce cinquième rapport annuel du Conseil pour la conservation des ressources halieutiques du Pacifique vous est présenté ainsi qu'à tous les Britanno-Colombiens. Conformément au mandat qui est le nôtre, nous faisons rapport selon notre point de vue quant à l'état des stocks de saumon et de leur habitat au cours du dernier exercice, soit d'avril 2002 au 31 mars 2003.

Notre tâche en tant que Conseil a été de faire des analyses, des observations et des recommandations sur la façon de favoriser la préservation et l'utilisation viables des stocks de saumons et de truites arc-en-ciel du Pacifique ainsi que de leur habitat d'eau douce et d'eau salée dans la province de la Colombie-Britannique.

Le rapport de cette année se présente différemment de ceux des années précédentes. Il est plus court et expose de façon plus concise nos points de vue et recommandations. D'autres rapports, qui suivront pendant l'année, présenteront des informations et des analyses plus poussées de la question et expliqueront le travail par nous accompli pour faire la synthèse des données et dégager les tendances chronologiques. Nous continuerons de publier des documents d'information et de consultation sur les questions prioritaires en d'autres occasions au cours des années qui viennent. Nous espérons, en modifiant notre approche, rendre disponible de l'information et des analyses qui ne sont pas facilement accessibles, pour permettre aux Britanno-Colombiens de comprendre la situation et l'avenir envisageable des stocks de saumon du Pacifique. En outre, à compter de 2004, nous ferons rapport chaque année civile plutôt que chaque exercice.

Le présent rapport s'inscrit dans la ligne de celui de l'an passé, dans lequel nous mettions l'accent sur les stocks de saumon de la partie sud de la province. Cette année, nous présentons un résumé des conseils que nous avons donnés sur les questions qui ont particulièrement retenu notre attention. Nous prévoyons publier plus tard au cours de l'année un document de consultation et d'information sur les stocks de saumon et leur habitat dans les régions centre et nord du littoral de la province.

Les stocks de saumon et de truite-arc-en-ciel ont diminué par périodes au cours de la dernière décennie, quoiqu'on ait récemment observé quelques améliorations en certains lieux sur les plans de la remonte et du taux de frai. Les causes du déclin sont parfois évidentes, mais elles sont parfois aussi difficiles à saisir, et donnent alors lieu à des suppositions savantes tout au plus. Par exemple, certaines populations de saumon coho du détroit de Georgia sont si peu nombreuses qu'elles sont au bord de l'extinction. On n'a fait que des progrès limités dans la compréhension de certaines des causes de l'effondrement de ces populations autrefois précieuses et productives. Les constatations, à ce jour, laissent penser que cet effondrement est le résultat de changements survenus dans les sources d'alimentation et la productivité, en rapport de quelque manière avec le climat océanique. Il apparaît de plus en plus que ces changements sont peut-être directement liés à la disponibilité de certaines espèces de plancton, notamment dans les tailles recherchées des alevins en phase d'alimentation. La disponibilité du plancton est elle-même liée entre autres choses au climat océanique. Par ailleurs, il ne fait pas de doute que la pêche de stocks divers de saumons de remonte tardive s'est traduite, pour les migrations anadromes de saumons du lac Cultus, par un taux de mortalité par pêche excessif, ce stock étant moins que d'autres résistant à la pêche.

Dans ses rapports annuels précédents, le Conseil recommandait que des améliorations soient apportées aux pratiques de conservation et d'évaluation des stocks de saumon ainsi que de protection et de restauration de l'habitat. Il reste encore beaucoup à faire pour étendre les connaissances sur la manière de mesurer l'état des stocks et la productivité du saumon. Dans le

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domaine de la protection et de la restauration de l'habitat, il se pourrait que la Colombie-Britannique continue de perdre sa capacité globale de préserver quantitativement et qualitativement les conditions aquatiques essentielles au saumon, et de prendre les mesures de sauvegarde ainsi que de mobiliser les ressources nécessaires au rétablissement des stocks. Le Conseil constate l'absence d'information de la part des gouvernements sur l'évolution de l'habitat du poisson, tant sur le plan de l'étendue que sur celui de la qualité.

Le Conseil a recommandé l'adoption d'une approche plus prudente en matière d'élevage et de mise en valeur du saumon, par exemple dans le cas des alevinières, de façon à atténuer les répercussions sur les populations de saumon sauvage et à réduire les risques pour leur potentiel reproducteur. La chose serait d'autant plus avisée que l'on manque d'informations crédibles sur la vulnérabilité du saumon sauvage des zones côtières et les dangers qui le menacent. On sait si peu de choses sur les écosystèmes littoraux et sur la phase du cycle de vie du saumon qui s'y déroule, qu'il est difficile d'évaluer les risques qu'ils comportent, sauf pour en observer l'apparente relation avec la mauvaise qualité des remontes dans bien des cas. L'interaction des saumons et la concurrence pour la nourriture sont des choses qui devront être étudiées de façon plus approfondie si l'on veut clarifier la façon dont les risques se manifestent pour le saumon sauvage et le moyen de les minimiser. Par ailleurs, il ne fait pas de doute que la mise en valeur de certains stocks accroît les risques de pêche excessive pour les stocks non mis en valeur qui font partie des mêmes pêcheries.

Le Conseil a consacré de l'attention et des ressources à la question des conséquences de la salmoniculture pour le saumon sauvage, et a encouragé l'établissement d'un dialogue public plus productif sur les controverses survenues à propos de la pisciculture. La contribution du Conseil à la mise en place du Forum sur l'élevage des salmonidés, dans l'espoir qu'il soit efficace, vise à permettre aux Premières nations, à l'industrie et aux autres intéressés de commencer à aborder ces questions de façon constructive.

L'an dernier, le rythme de l'activité du Conseil, et notamment la production de rapports, de documents de consultation et de documents d'information publique, s'est accéléré sensiblement, sans accroissement concomitant des dépenses. La stature du Conseil dans l'opinion publique a nettement augmenté, comme en témoignent la multiplication des mentions le concernant dans les médias et le nombre des visites sur son site Web. Le Conseil constate avec satisfaction la valeur que les ministres et les cadres supérieurs du gouvernement accordent à ses conseils, et l'appui que les divers intervenants et le public apportent aux mesures de conservation novatrices des salmonidés qu'il a mises de l'avant.

J'ai été heureux et honoré de travailler avec un conseil composé de membres aussi compétents que dévoués : Mark Angelo, Mary-Sue Atkinson, Frank Brown, Murray Chatwin, Merrill Fearon, Paul LeBlond, Jeff Marliave, Marcel Shepert, Carl Walters, Dick Beamish (d'office) et Arnie Narcisse (d'office).

Lors de la séance de consultation organisée à Victoria par le Conseil l'an dernier, l'un des intervenants a exprimé l'idée que trop de gens semblent avoir perdu espoir quant à l'avenir du saumon sauvage. La prépondérance des mauvaises nouvelles dans les médias alimente peut-être ce pessimisme. Cependant, le Conseil ne partage pas cette vision sombre de l'avenir du saumon de la Colombie-Britannique. Il est possible, par un effort concerté, de restaurer et de protéger les stocks tout en facilitant la pêche. Les décisions clés sur les pêcheries doivent être prises dans le cadre d'une action de collaboration constructive faisant intervenir le bien commun, et non sur un champ de bataille entre des intérêts divers qui ne songent qu'à s'arracher les ressources.

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Président

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Executive Summary

The effective conservation of Pacific Salmon requires a comprehensive effort by governments acting with an informed and involved public. The work of the Pacific Fisheries Resource Conservation Council in the past year has been directed towards encouraging the rebuilding of key salmon stocks and the restoration of habitat conditions that are crucial for future stability in British Columbia's salmon populations.

The Council has highlighted the risks resulting from the recent and proposed government funding reductions in programs that have been instrumental in monitoring and restoring salmon stocks. It has proposed that resources be refocused, especially into habitat initiatives that could maintain genetic diversity of salmon populations in crucial areas.

During the past year, the Council members have pointed out the shortcomings of the results-based management approach, and suggested that stringent regulatory and enforcement measures be maintained, particularly where there are irreversible consequences of salmon declines. The Council was involved during the past year in the conservation aspects of the Fraser River sockeye fishery and the Okanagan ecosystem restoration, providing support for measures aimed at protecting the salmon stocks.

The declines in pink salmon returns and evidence of extensive sea lice in the Broughton Archipelago led the Council to carry out consultations and produce an advisory that proposed an extensive change in the management of fish farms in the area. The governments of Canada and British Columbia subsequently introduced significant measures to monitor conditions and reduce potential exposure of wild pink salmon and other smolts to sea lice.

The Council sponsored a consultant's study that examined the assumptions and scientific information supporting the divergent arguments about interactions between wild and farmed salmon. Their background paper pointed to sea lice as the most immediate area of risk, and presented an evaluation of the other risk factors related to bacteria and viruses, escapes, and habitat impacts. The Council's advisory on aquaculture and wild salmon led to the acceptance of that report's most crucial recommendations, including the creation of a Salmon Aquaculture Forum to enable more constructive public dialogue on aquaculture issues.

In the coming year, the Pacific Fisheries Resource Conservation Council's agenda includes its contribution to establishing the Salmon Aquaculture Forum, initiation of a consultant's study on hatcheries, and preparation of a report on the impacts of low water levels on salmon. The Council will also complete its detailed report on the northern and central coast stocks to complement last year's exhaustive study of southern British Columbia's salmon stocks.

Sommaire

La conservation du saumon du Pacifique exige un effort global des gouvernements et l'action d'un public informé. Le travail accompli l'an dernier par le Conseil pour la conservation des ressources halieutiques du Pacifique visait à favoriser la reconstitution des principaux stocks de saumon et le rétablissement des conditions d'habitat essentielles à la stabilité future des populations de saumon de la Colombie-Britannique.

Le Conseil a attiré l'attention sur les risques liés aux réductions récemment proposées du financement public de programmes qui ont joué un rôle clé dans le suivi et la restauration des stocks de saumon. Il a proposé que les ressources soient réorientées, notamment vers des activités de nature à préserver la diversité génétique des populations de saumon dans les zones d'importance cruciale.

L'an dernier, les membres du Conseil ont souligné les lacunes de la gestion axée sur les résultats, et suggéré que les mesures de réglementation et d'exécution sévères restent en vigueur, en particulier là où le déclin des populations de saumon aurait des conséquences irréversibles. Le Conseil est intervenu l'an passé dans l'aspect conservation des activités de pêche au sockeye du Fraser et de restauration de l'écosystème de l'Okanagan, en appuyant diverses mesures de protection des stocks de saumon.

Le déclin des remontes de salmonidés et les signes de la présence du pou du poisson dans l'archipel Broughton ont conduit le Conseil à prendre avis et à produire en conséquence un document de consultation qui proposait un changement en profondeur de la gestion de la pisciculture dans la région. Les gouvernements du Canada et de la Colombie-Britannique ont pris par la suite des mesures importantes pour suivre l'évolution de la situation et réduire le danger potentiel que le pou du poisson représente pour les saumoneaux roses sauvages.

Le Conseil a parrainé l'étude d'un consultant sur les hypothèses et les données scientifiques mises de l'avant pour appuyer les opinions divergentes sur l'interaction entre saumon sauvage et saumon d'élevage. Ce document présentait le pou du poisson comme un des facteurs de risque les plus directs, et comportait une évaluation des autres facteurs de risque liés aux bactéries et aux virus, aux échappements et aux modifications de l'habitat. Le document de consultation du Conseil sur la pisciculture et le saumon sauvage a conduit à faire accepter les recommandations les plus fondamentales de ce rapport, y compris la création du Forum sur l'élevage des salmonidés (Salmon Aquaculture Forum) pour permettre un dialogue public plus constructif sur les questions entourant la pisciculture.

L'an prochain, le Conseil pour la conservation des ressources halieutiques du Pacifique s'est donné pour objectif d'apporter sa contribution à la mise sur pied du Forum sur élevage des salmonidés, de commander un document de consultation sur les alevinières, et de préparer un rapport sur les conséquences de la baisse du niveau des eaux pour les saumons. Le Conseil rédigera en outre un rapport détaillé sur les stocks du centre et du nord de la côte pour compléter le rapport approfondi qu'il a produit l'an passé sur les stocks de saumon du sud de la Colombie-Britannique.

1. Introduction

Each year, the Pacific Fisheries Resource Conservation Council reviews the condition of salmon and steelhead stocks and habitat in British Columbia, and offers comments and advice on the ways to ensure long-term sustainability.

Since the Council's establishment in September 1998, we have addressed various crucial issues in our annual reports, background papers and advisory publications. We have held public consultations and met with British Columbians across the province. Several crucial government decisions, in areas such as coho rebuilding and the proposed Wild Salmon Policy, have been influenced by the information, analysis and ideas we have presented as a Council. Throughout our work, we have encouraged the adoption of more effective salmon conservation policies and priorities.

The Council puts forward strategic advice from a long-term perspective to the Minister of Fisheries and Oceans Canada, the British Columbia Minister of Fisheries, and the general public. Among the functions specified in the assigned terms of reference, the Council has been asked to:

- identify salmon stocks in need of conservation action;
- describe salmon-related conditions for both freshwater and marine ecosystems;
- recommend research diresctions, stock assessment, and enhancement measures; and,
- integrate scientific and aboriginal ecological knowledge to enable the development of salmon conservation policies and practices.

This annual report puts forward the current findings related to stock status and habitat conditions, and it presents a summary of the Council's viewpoints on some of the most significant and immediate matters of concern. In some instances, the comments summarize and clarify the positions explained in previous Council reports. In other cases, such as salmon aquaculture, this report contains the Council's more recent consensus views.

This year's report marks a departure from the past practice of issuing annual reports that contain extensive reporting on new and specific issues. The Council has decided to present briefer annual reports that contain summaries of its recent and projected studies and activities. The purpose is to summarize the issues that concern the Council and provide a focus for government attention to the recommendations that have recently been made to them.

At the same time, there is a series of background papers and advisories planned for the coming several months that will present information and advice on issues, including the impacts of low water levels and hatcheries on wild salmon populations. Having these background papers issued separately from the annual report should help to draw more public attention to the salmon fisheries issues they address. In too many instances in the past, the specialized background papers and extensive analysis contained in the annual reports were given insufficient consideration relative to the higher-profile policy advice of the Council.

The Council intends to expand its public consultations further throughout the province in the coming year, and continue the past year's initiatives that involved Council members and staff making presentations to civic groups and public meetings and giving briefings to elected officials. It will build on last year's initiatives, such as the presentations to the Senate and House of Commons committees investigating Pacific salmon topics. Council members will continue to participate in the Pacific Scientific Advice Review Committee and its effective work in encouraging and interpreting salmon research.

2. Stock Status Overview

Conditions and Concerns

There was evidence during the past year of improving abundance in several salmon species within key geographic areas. Stronger returns are forecast in many instances relative to recent trends. A consequence is that the most recent *Salmon Expectations* statement issued by Fisheries & Oceans Canada stated that commercial and sports fishing is expected to be permitted to a greater extent than in recent years.

There have been, however, some notable and troubling exceptions to this improving trend. Significant problems noted in previous reports by the Council continue to defy solutions and in some cases will require more diligence and consideration. The Council's attention to particularly troubling stocks and areas has mirrored those recently identified by Fisheries & Oceans and BC government officials. For instance, the persistent problems of Thompson River coho in the South Coast and chinook on the West Coast of Vancouver Island have continued to be obvious.

The fishing restrictions related to coho have proven to be successful in enabling the stocks to rebuild, and some further easing of those restrictions is expected. At the same time, the stocks remain vulnerable and may require considerable time to reach adequate levels of recovery.

A continuation of poor abundance of sockeye in the Central Coast is also a concern. The Council's previous comments on the seriousness of the situation in Smith Inlet and Rivers Inlet continue to apply. The strict conservation measures that have been in place for many years must be continued to enable the area's stocks to rebuild.

Sockeye returns to Barkley Sound and the Fraser River generally improved, but concerns for in-river survival of late-run Fraser sockeye again limited the extent of the fishery.

Returns of sockeye salmon in the southern region increased in 2002, but two lake-rearing sockeye stocks were listed by the Committee on the Status of Endangered Wildlife in Canada as being Endangered. The late-run Fraser River sockeye returns are more fully described later in this report, but there is an emerging issue of the stocks in the numerous small lakes in the southern region of the province. These lakes contain sockeye, as noted in the Council's 2001-2002 annual report, but their status is largely unknown. The two sockeye populations – in Cultus Lake in the lower Fraser River and in Sakinaw Lake in the Strait of Georgia – were listed as being endangered in October 2002, but there may be others with serious conservation problems.

While there have been some widely-noted improvements in salmon returns, as were observed in the Council's recent annual reports, the sheer numbers can be deceptive. They do not tend to capture the crucial qualitative aspects, such as the extent of biodiversity that is at risk. For instance, the strong escapement increases of pink salmon in the southern region may give the illusion to some people of an overall improvement. However, it must be kept in mind that those numbers of spawners increased in part because fishing for pink salmon did not take place at the same levels as it did in previous years. Of great concern, in the same year of those strong southern pink salmon returns, the Broughton Archipelago pink salmon in the central region showed dramatic declines. The contrast may reflect different limiting factors, but the differences illustrate how the status of salmon stocks must be examined at local levels of diversity and annual returns. Also, the improvements in ocean conditions that brought increases in salmon returns in recent years may be relatively short-lived because, as has become apparent, ocean productivity can change quickly and significantly.

Fraser River Sockeye Fishery Review

During the past three years, the Council expressed alarm about the late-run Fraser River sockeye salmon. The past two annual reports highlighted the dramatic declines in spawning and production of the stocks that included those returning to the Adams River, Lower Shuswap River, Harrison River, Weaver Creek and Cultus Lake.

Based on the pre-spawning mortality observed in late-run Fraser River sockeye in recent years, the Council members urged that special care be taken in conducting any fisheries on these stocks. Late-run sockeye would likely be intercepted in fisheries on summer-run sockeye.
The problems of recent years of devastating pre-spawning mortality were expected to continue. Pre-season plans by Fisheries & Oceans Canada had assumed a 90% pre-spawning mortality for the late-run sockeye. It was fortunate that the run size of late-run sockeye was larger and the extent of pre-spawning mortality was not as severe.

Fisheries managers were severely criticized for delaying fishing opportunities and causing lost fishing revenue. It was suggested by some that the fishery should have been opened sooner and with more extensive limits than were permitted. However, the run size was not readily apparent and the in-river mortality rate could not be known until after the typical fishing season.

The public controversy surrounding fishing limitations for Fraser River sockeye during the 2002 fishing season was addressed in a review by an external steering committee report to Fisheries & Oceans Canada published in March 2003. Representing the Council in that process was its Scientific Advisor, Dr. Brian Riddell. That review has provided an insightful look at how future stock management decisions could be made on a more timely basis and with greater accuracy in terms of estimates of run size and timing. In fact, new information resulting from last year's late-run studies, particularly radio tagging, should help greatly in designing more flexible fishery management strategies. However, it is important to note that, while last year's low late-run mortalities and resulting high escapements were excellent news for the cycle, it cannot yet be assumed that the problem has disappeared. A precautionary approach is still in order.

The Council's advice in this instance, as in most cases, was driven by the precautionary approach and the need for fisheries decision-making to account for all of the factors that could be undermining salmon stocks and having environmental impacts. The basic causes and triggers of the pre-spawning mortality are still not scientifically identified, and much more research is needed to help prevent future declines in these stocks.

In the Council's view, the fisheries managers were not unduly cautious, given the sockeye mortality trends of recent years and the evidence that was available at the time that the decisions were being made. Future management decisions for the Late-run Fraser River sockeye should continue to account fully for the considerable potential for devastating pre-spawning mortalities, and the precautionary approach should continue to serve as the prevailing guideline.

In a letter to the officials who conducted the review, the Council observed that Fisheries & Oceans Canada, with the support of the Pacific Salmon Commission, set very conservative 2002 harvest limits on the late-run Fraser sockeye. During the summer, there is no way of knowing the final return or the number of spawners that will survive. Given the severity of possible effects, the Council supported the fishing restrictions that were introduced, and cautioned against complacency about future problems in light of the lack of knowledge about the root causes of the pre-spawning mortality.

Sockeye salmon in the Adams River

Northern and Central Stocks

The Council has been reviewing in considerable detail the status of stocks in the northern and central regions of British Columbia. This review has been taking place as a supplement to the intensive study of the southern region in last year's annual report. While the findings and recommendations are expected to be released later this year as a stock status report and advisory, some initial observations can be offered on the basis of the information and data collected so far.

- There has been wide variability in the marine survival of salmon during the 1990s throughout the central and northern regions. Notable problems that are being or have been addressed include the interior Skeena coho salmon and recovery programs for sockeye salmon in Owikeno Lake (Rivers Inlet) and Long Lake (Smith Inlet).

- Many small sockeye lakes and populations exist in addition to the large sockeye producing lakes, just as they do in the southern region. On a broad basis, there have been far more of these sockeye populations in the northern and central region that are "depressed" relative to historical levels and/or are declining in abundance, compared to those that have been stable in stock size or increasing in abundance. A recent extensive review of sockeye lakes in the Skeena River watershed has identified this as a conservation concern, given that fisheries have typically been targeted on the enhanced Babine Lake sockeye populations.

- There are serious knowledge gaps in terms of sockeye stock status in many cases because the task of enumerating is difficult and there are inconsistent records of escapement. The data has become much more limiting since the 1980's largely due to reduced survey effort.

- While Nass River sockeye increased in production during the past decade, so did the harvest rate on them. With half of the Nass river populations being assessed as decreasing or depressed for recent escapements, these trends merit concern.

- It is becoming more important than ever for salmon conservation and rebuilding plans in the region to involve local communities and First Nations organizations. New methods of monitoring stocks and obtaining information on stock status should continue to be explored.

Species at Risk Act

New federal legislation entitled the Species at Risk Act (SARA) came into force on June 5, 2003. It encompasses an array of wildlife and plants, including salmon, and sets out specific requirements for the establishment of plans and effective action for the conservation and recovery of threatened and declining species. Some salmon species, such as Cultus Lake sockeye and Thompson River coho, have already been considered and treated as at-risk stocks under other federal classification processes, but the new legislation may widen the inclusiveness of the 'at-risk' list and result in more extensive conservation efforts.

A significant element of recovery plans and implementation is multi-stakeholder involvement. The participation of government officials, scientists, commercial and recreational harvesters, community groups, First Nations and conservation advocates will be enlisted, and their cooperation and guidance will be crucial.

This legislation could have a significant effect on the fisheries in forcing action where the risk of losing the biodiversity of salmon becomes evident. The fisheries management regimes of the federal and provincial governments are expected to change in order to demonstrate effective conservation for salmon stocks. The Council will be closely monitoring the application of the new legislation, and evaluating its impact in terms of the at-risk salmon species.

Wild Salmon Policy

The Pacific Fisheries Resource Conservation Council welcomes the recent announcement of the renewal of public involvement in a wild salmon policy development process. Officials in Fisheries and Oceans Canada conducted extensive public consultations three years ago and then proceeded with an internal government review of the elements of the Wild Salmon Policy.

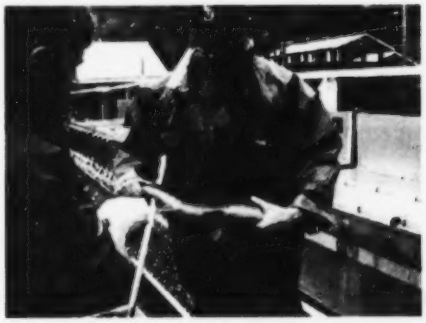
In stating its position on the Draft Wild Salmon Policy in June 2000, the Council suggested that the proposed policy had serious flaws and needed to be revised. It said the policy should articulate a single, clear and unequivocal statement that wild salmon will enjoy management priority when it comes to making decisions about salmon on Canada's west coast. The Council expressed its view of the ultimate importance of the effort to develop an effective policy framework:

> *The wild salmon policy will be the most important policy document that Fisheries and Oceans Canada will produce in this decade... If the policy is strong, explicit and addresses the foreseeable issues, it will contribute to conserving and sustaining salmon resources.*

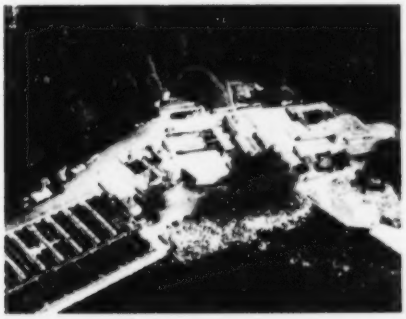
The Council has noted that a Joint Wild Salmonid Policy was created more than five years ago by the Washington Fish and Wildlife Commission and the Western Washington Treaty Tribes. While that policy has some unique political and jurisdictional circumstances, it provides a template of topics and questions to consider as aspects of a wild salmon policy in Canada. For instance, the Joint Wild Salmonid Policy in Washington states as its goal:

> *"...to protect, restore, and enhance the productivity, production, and diversity of wild salmonids and their ecosystems to sustain ceremonial, subsistence, commercial, and recreational fisheries, non-consumptive fish benefits, and other related cultural and ecological values."*

The implementation of that Washington State policy, and the challenges involved in it, may inform the current Canadian effort to implement a comprehensive and workable policy framework. The new Canadian Wild Salmon Policy, driven in part by the need to adhere to the requirements of the Species at Risk Act, should become a cornerstone of Canada's salmon conservation management



Sorting adult salmon at a hatchery (Vivan Magnusson)



Capilano Hatchery

Hatchery Study

Hatcheries have been widely supported institutions that have been intended to supplement natural production of salmon, replace production where wild stocks have declined, and serve as an educational tool to increase public awareness of the fish and their significance. However, as noted by the Council in last year's Annual Report and despite the significant output of juvenile salmon from hatcheries, recent years have demonstrated that a consistent overall increase in salmon production has not resulted.

In many respects, the hatcheries have succeeded in promoting public understanding of salmon and increased overall production in some cases. At the same time, there is growing concern about their long-term effects on wild stocks, as well as their impact on the genetic composition and health of wild salmon. Issues related to biodiversity of salmon, quality of hatchery stocks, and competition for food have been the subject of some recent investigations that have begun to raise troubling questions.

Hatcheries have public support, but it is timely for their activities to be considered in light of both positive and negative effects, particularly in terms of the interactions of hatchery and wild fish. With that in mind, the Council will engage a consultant in 2003 to produce a background paper will help to advance public understanding on the interactions of hatchery-produced salmon, including steelhead, with wild salmon and steelhead in British Columbia and the Yukon Territory. They will also describe the essential discussion points of the hatchery debates, explain the dimensions of hatchery operations, and provide an analysis of the scientific issues. Associated public consultations and the resulting report are intended to allow lay persons to understand the situation and options, and enable public education on the topic.

The consultants' background paper and a subsequent Council Advisory are expected to be released before the end of March 2004.

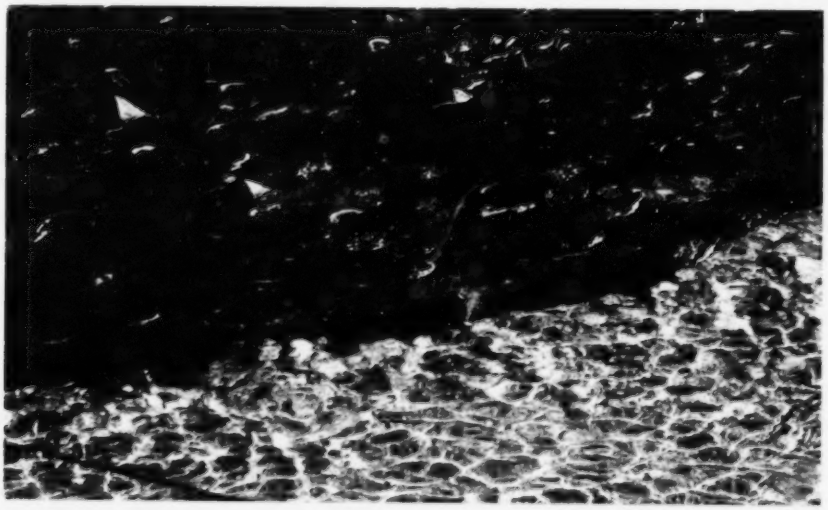
Study on Overspawning Concept

The Council is proceeding this year in response to a request by the Minister of Fisheries & Oceans Canada to provide information and advice on the overspawning concept as it relates to Pacific salmon.

Some fishery advocates have contended that restrictions on fishing have the consequence of allowing too many salmon to return to natal lakes, thereby actually undermining the potential for maximizing productivity. On the other hand, many conservation groups are not generally supportive of the notion of overspawning. In their opinion, there is no validity to the notion of too many fish on the spawning grounds, and spawning salmon have broader ecological roles than simply providing future maximized yield.

The Council's study will consider the various arguments that are being put forward, and examine whatever scientific evidence might be available. This will be a relatively small-scale review, and it will be intended to provide a basis for informed public discussion.

The Council plans to proceed with this project later this year and produce a background paper.



Sockeye salmon

3. Habitat Status Overview

Conditions and Concerns

The size and health of Pacific salmon populations can fluctuate for many reasons, often regardless of human intervention. However, human impacts on salmon stocks through effects on habitat and water conditions, particularly water volume, are growing and the consequences will challenge the resilience of salmon.

The tasks of restoring and protecting habitat have been the focus of increasing public involvement and awareness across British Columbia. The voluntary effort of people from all walks of life in rebuilding salmon streams and spawning areas has been one of the most heartening trends of the past two decades.

There is no standard way of measuring the status of salmon habitat. While scientific methods have been created and extensively applied to measure stock status, there are few tangible ways to monitor overall habitat quality and effects, apart from those that are catastrophic, such as stream blockages or poisonous water conditions.

Some habitat conditions, such as polluted water and disrupted streambeds, are obviously detrimental to salmon health and productivity. However, there is often no readily evident way to measure the severity of the impact. Like human exposure to some toxic materials, salmon exposure to conditions in their habitat might have no apparent or immediate effect, but could be seriously detrimental, with consequences that emerge over time. In many respects, the habitat impacts on salmon are from the cumulative effects of several different problems, rather than attributable to a single factor.

The need for research that addresses the issues of habitat impact on salmon is obvious. At the same time, the traditional emphasis in fisheries science has been on refining the enumeration of salmon and the biological aspects of the discipline rather than venturing into the realm of new theories about salmon habitat. Fisheries & Oceans Canada officials who deal with habitat have focussed largely on reviewing individual developments and becoming engaged in planning studies to prevent activities that would otherwise erode or threaten habitat conditions. In addition to this valuable activity, there is a need for a new approach that can enumerate the amount of habitat on a watershed or ocean unit basis. Without an understanding of trends in the amount of usable habitat that is available there are constraints on the ability to conserve and manage the fisheries resource effectively.

A new approach that builds a scientific basis for salmon habitat monitoring and assessment is long overdue.

Jurisdiction and Cooperation

Federal jurisdiction and responsibility for salmon habitat protection and management comes from the Constitution Act, with the Canada Fisheries Act and its regulations identifying the associated legal requirements. The requirements described in that legislation are defined further in the Fisheries & Oceans Canada Policy for the Management of Fish Habitat and its objective of "net gain" of habitat productive capacity.

The no-net-loss principle also stated in that policy was meant to proclaim the Government of Canada's intent to protect habitat productive capacity from losses by various forms of development. However, only rarely is "net gain" or "no net loss" in productive capacity considered in a watershed or ocean ecosystem perspective. For example, no-net-loss with regard to forest harvesting may not be achieved until after sufficient growth of forest cover decades from now.

Property-related development and resource use is a provincial responsibility. The Government of British Columbia issues the development permits, defines the development limitations and requirements, and enforces the terms of the licenses.

Federal and provincial government agencies have worked together to develop implementation guidelines for various industries and types of developments, particularly for riparian and stream-impacting projects. There may now, however, be a growing gap between the levels of governments in their habitat management policies. The results-based regulatory strategy is leading to a withdrawal of the BC Government from regulatory activities where Fisheries & Oceans Canada also has responsibilities. While the provincial government may consider this an appropriate policy change, the appropriateness of the new approach is not so apparent to the federal government that must take a national perspective in resource management. A result has been growing pressure for the Government of Canada to intervene and discharge its legislated authority in this field, particularly in requiring adherence to conservation standards.

However, the Government of Canada and Fisheries & Oceans Canada in particular lack the resources for assessment, monitoring and enforcement on an adequate scale. In circumstances of minimal government oversight, environmental problems will increasingly be addressed only after they become apparent and entrenched, and no adequate remedy may be available at that point.

The Pacific Fisheries Resource Conservation Council is concerned that addressing fisheries habitat problems after the fact is much more expensive and risky than doing it on a preventive basis. It takes too long to respond to problems and introduce remedies.

Over a period of many years, the governments of Canada and British Columbia worked towards creating a seamless regulatory structure in fisheries management and conservation. The budget cuts and establishment of new regulatory regimes, such as the results-based approach, are threatening to create perilous regulatory gaps and expose salmon stocks to more serious risk. Both levels of government must proceed more prudently with any budget reductions and regulatory changes to ensure that they do not inadvertently expose the salmon stocks to more serious harm.

Okanagan Ecosystem Issues

The Council is continuing to build on the work it began in the Okanagan region three years ago in conjunction with First Nations leaders and organizations. Council members had been approached to assist in raising the public profile of fisheries habitat conservation initiatives that had been compromised during several decades of changes in the environment, including water extraction, riparian deterioration and stream straightening.

In visits to the region and participation in local conservation discussions, the Council has supported the process of building a coordinated approach to restoring sockeye salmon runs across the Canada-US border. The cross-border connection of the Okanagan and Columbia rivers makes cooperation essential and creates a challenge for the creation of new mechanisms for

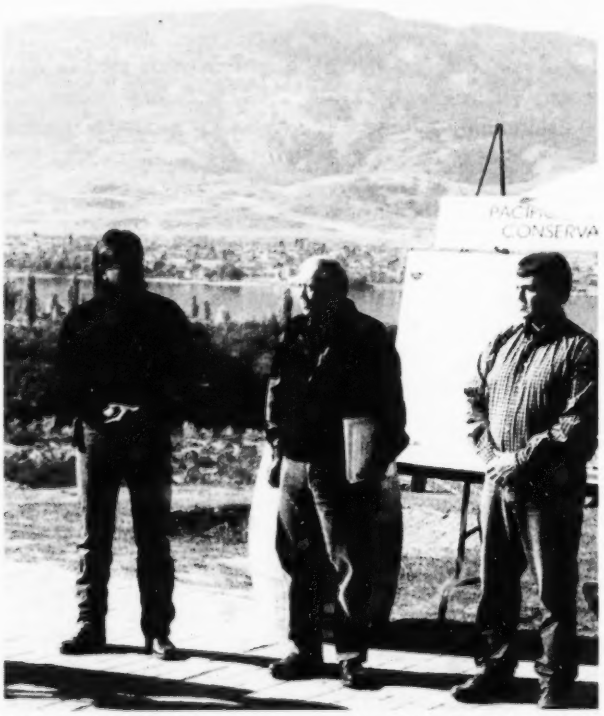
organizations in both countries to work together and reinforce one another's salmon rehabilitation and habitat projects.

On behalf of the Council, the Chair recently made the following observation:

> *What should be noted is that the recovery of Okanagan sockeye (and other species) is truly an ecosystem challenge; but, it is also an opportunity for Federal/Provincial, inter-agency and international collaboration. In this regard, we have emphasized that much can be done by agreeing across government, agency and national boundary lines to work in harmony with each other. Which, of course, means defining the problems, agreeing on the answer and taking action in a number of diverse ways. My point is that we don't need an international treaty, or even a Federal/Provincial accord, to get on with much of what needs to be done.*

The role of the Council in the Okanagan projects continues to be in providing support to the local initiatives and assisting in making the case to governments and other funding sources for additional financial support. The Okanagan system should be seen within the vision for watershed management of the Columbia Basin and the Pacific Northwest. In essence, it requires the creation of a cross-boundary conservation constituency that governments will take seriously and begin to recognize as being useful and productive.

The Council will serve as part of the growing and evolving conservation constituency for the Okanagan as a trailblazing way to bring everyone together to begin implementing comprehensive salmon habitat restoration in the region.



PFRCC 2002 Annual Report release at the International Okanagan River Salmon Festival
Left to Right: Byron Louis, Hon. John Fraser, Joe Peone

Senate Presentation on Habitat

In March 2003, the Council provided a brief to the Canadian Senate Standing Committee on Fisheries & Oceans regarding the report that Senators were preparing on fish habitat.

Senators were told about the findings contained in the Council's extensive background papers and reports on habitat, including those that looked at gravel, water quality, water temperatures, climate change and stream flows. They were told that key threats to salmon include those traditionally associated with land use practices such as forestry, mining and agriculture and other developments. They also include transportation routes and their associated stream crossings, urban development, sewage treatment and industries impacting water quality.

The Council also pointed out what could become new threats to salmon habitat, such as offshore oil and gas development or reckless expansion of salmon farming. The adoption of results-based management could also raise the levels of risk for salmon habitat where impacts are not necessarily evident until years after development has been initiated.

In their appearance on behalf of the Council, the Honourable John Fraser, Dr. Paul LeBlond and Dr. Jeff Marliave pointed out that the value of the wild salmon resource to British Columbians is beyond that of a commercial food source, For instance, the value of salmon to the sport and tourism sectors is crucial and growing, and its value to aboriginal fisheries cannot even begin to be calculated.

Low Water Study

The increased interest of the Pacific Fisheries Resource Conservation Council in ocean-related salmon conservation should not be interpreted as a lessening of concern about freshwater issues. As water availability becomes increasingly rationed, freshwater habitat limitations are again becoming key factors in determining salmon production. The disruptions in spawning and interference in migration continue to be problems that may plague any efforts to rebuild stocks.

The attention of the Council to water concerns continues, building on the work contained in the three background papers on water-related issues since the Council's inception. The decision to proceed this year with an investigation of low-water was reinforced by the experience of the US states bordering the Pacific. The impact of the worst-ever drought conditions in Oregon was especially severe two years ago, and was exaggerated by excessive water allocations for development and agricultural purposes. In the competition for water, salmon and other fish habitat throughout the state's river systems was undermined. The situation in Oregon was described vividly by the state's governor, John Kitzhaber, in a speech last year:

> *The result has been an economic, environmental and community disaster – leaving 200,000 acres of irrigated farmland without water; inadequate stream flows and lake levels to support endangered fish and wildlife; and a community torn by fear, doubt, unemployment and – increasingly – by anger, alienation, polarization and civil disobedience.*

He went on to explain:

> *That this crisis happened should surprise no one – because we all saw it coming. We have been talking about the competing demands for water in the Klamath Basin for more than a decade – talking, but not acting.*

Given the erratic climate shifts that are becoming more prevalent, a severe drought in British Columbia could create many of the same crisis conditions that arose in Oregon over water rationing and competing priorities for agriculture, fish passage and human consumption. The Oregon and Washington drought impact on salmon was cited during the Council's consultations as a lesson that Canada should heed. Arnie Narcisse, Chair of the BC Aboriginal Fisheries Commission, pointed out that, in light of the experience in the American states, it might already be too late for British Columbia to take precautionary measures if climate conditions bring on similar water shortages in the province.

Water management has become an escalating conservation concern. Decreasing water levels in lakes and streams and deterioration in some aspects of water quality are increasingly limiting fish production in many areas of the province. Some of the problems relate to inefficient use of water, such as wasteful irrigation systems and antiquated water licences that often allocate flows with no allowance for fish, the ecosystem or other water users. It is past time to modernize those water licences and their associated user fees to provide an incentive to conserve and make better use of water.

The water problems also relate to ineffective waste management, particularly water-based waste disposal, but also pollution of groundwater. In the dry belt, removing riparian vegetation results in summer heating of streams, often to near lethal temperatures. Removal of natural forest cover and alteration of drainage and runoff patterns dramatically impacts salmon spawning, rearing habitat and overall productivity. Increased poaching and predation on spawners and juveniles also comes with urban development. The majority of Fraser pink, chum, coho and chinook salmon originate in streams in the Fraser valley that are increasingly subject to intensive agricultural, industrial and urban development.

At the current rate of impact, much of the salmon production will inevitably be lost and the remainder will be seriously compromised within the next twenty years.

The Government of British Columbia has generously made Dr. Marvin Rosenau available to conduct the Council's low-water study that is currently in progress. The findings will be published later this year. He has previously carried out highly acclaimed salmon habitat research contained in background reports produced on behalf of the Council.

4. Core Issues and Last Year's Activities

Government Spending and Policies

Adverse economic conditions and government budget deficits at various times during the last two decades have provided the backdrop for the governments of both Canada and British Columbia to reduce their expenditures in fisheries and related sectors.

There have been significant and persistent budget cutbacks in virtually all areas of fisheries management. The Fisheries Renewal BC program has been terminated. The federal Pacific Fisheries Adjustment and Restructuring Program annual funding of about $8.1 million per year for habitat conservation and stewardship programs has run out. Even before these expenditure reductions, resources were not adequate to ensure the basic protection and conservation of salmon populations.

The ability of the stewardship groups to continue to work with Fisheries and Oceans Canada is being compromised if not decimated by the federal spending reductions. New funding is necessary for stewardship groups to continue to have an essential role as cost-effective participants in habitat rehabilitation and salmon protection.

The Pacific Fisheries Resource Conservation Council has continually urged the two levels of government to assign more financial resources to conserve and protect Pacific salmon. This has not simply been the predictable advocacy for interests that are related to the Council's mandate. Instead, it is in recognition of the shortcomings cited earlier in this report, specifically the lack of sufficient values assigned to salmon resource conservation.

While the Council has focussed on the Government of Canada in terms of its budget reduction, it has noted that the BC Government has proceeded with its own extensive cutbacks in spending and personnel related to fisheries.

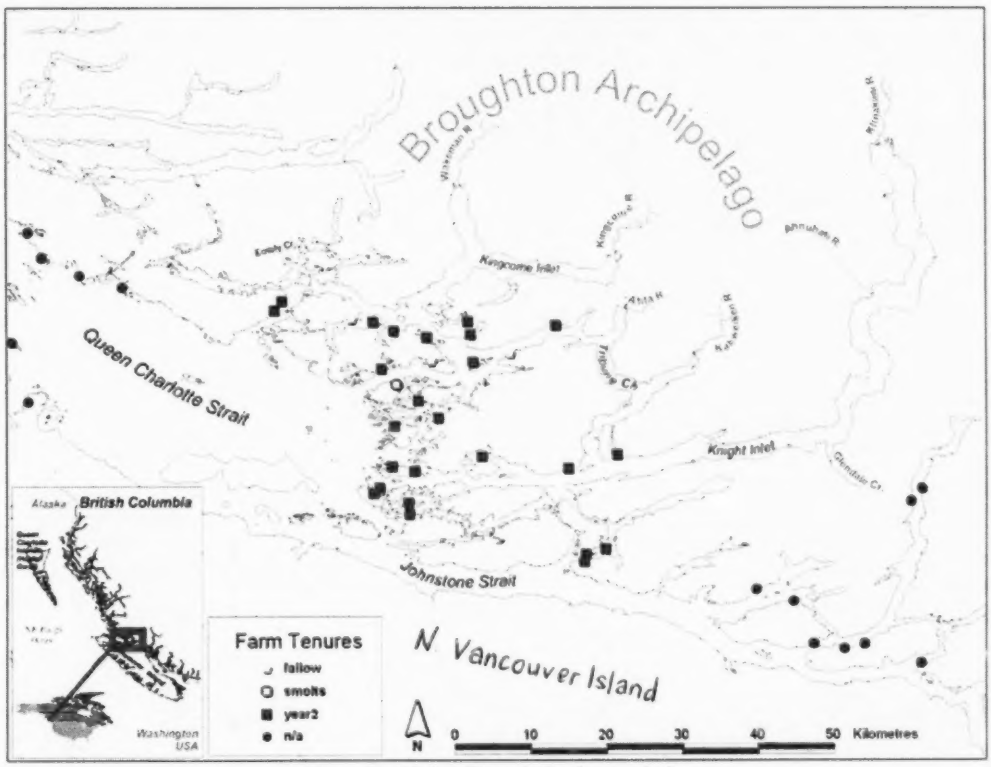
The BC Government has authority in several key salmon-related activities, including delegated responsibility for steelhead salmon management. On a broader scale, it has a wide scope of involvement in tasks that directly impact all salmon species. These tasks and the potential role of the BC Government were explained by John Fraser in a speech in Spokane, Washington last year when he stated:

> *In Canada, the Federal Government constitutionally has jurisdiction over and responsibility for salmon – in fact, all fish – except where the Federal Government has delegated authority to a Province. So, one might ask, if the Federal Department of Fisheries & Oceans has the authority and responsibility, why involve the Province? And the direct answer is in two parts: first, the Province has an acute interest in salmon because of its economic, tourism and recreational value; and, the second is this: under the Canadian constitution, the Province has authority and responsibility for all the following: highways, municipalities, agriculture, forests, mining, gas and oil, grazing, land use, provincial parks, gravel extraction, pollution control, education, power production and very importantly, water rights. In other words, it could be argued that if the Federal Government did not exist, the Province could, on its own, do everything, or nearly everything, to protect, restore and enhance salmon habitat.*

The Council considers the BC Government's changes in its institutional approach and adoption of a results-based regulatory model to be a potential threat to successful habitat management. While this approach may be appropriate for regulating financial services or other systems, it is not

suitable for fisheries habitat. For instance, the BC Government has been the lead in an effective referral system with federal government participation that involved habitat protection staff watching for proposed new developments and then working proactively with developers at the planning stages to prevent environmental and habitat damage. The BC Government is now pulling out of that referral system.

Both governments should reconsider the fundamentals of the direction of their budgets and regulatory models. They need a revitalization in terms of their mandate for the protection of wild salmon and other native fish species, not an abrogation of responsibility that a results-based approach might amount to.



From the Living Oceans Society website
http://www.livingoceans.org

Broughton Archipelago Advisory

In late summer 2002, the Council was advised of what appeared to be emerging problems concerning sea lice on pink salmon smolts in the Broughton Archipelago in the central coast region. An initial investigation of the findings led the Council members to proceed with a more extensive assessment of the situation, even though the issues seemed to involve both farmed and wild salmon and possibly their interaction. The decline in the number of spawners from 3.6 million to 147,000 signalled a serious problem in eight pink salmon spawning populations in the Broughton Archipelago.

The Pacific Fisheries Resource Conservation Council is mandated to consider matters pertaining to wild salmon stocks. The Council's perspective is that salmon farming, where it is carried out, cannot be allowed to put wild salmon populations at risk. That view was contained in the October 2001 presentation by the Council's Chairman to the Leggatt Inquiry:

> *Put simply, the question is: What is going to take priority? Conservation, preservation and enhancement of our wild salmon, or the understandably commercial and exploitive needs of a growing industry? And we would hope to have the industry with the benefits that it brings, but we feel very strongly that whatever is done with salmon farming has got to be consistent with the first priority and that is our wild salmon stocks.*

With that consideration in mind, the Council put together and issued an Advisory in November 2002 entitled *The Protection of Broughton Archipelago Pink Salmon Stocks.* The process began with a public consultation in Campbell River and involved an extensive consideration of possible causes and investigation of contributing factors. This included the significance of ocean temperature, freshwater regimes, oxygen levels, sedimentation, and an array of other elements, including the transfer of sea lice between farmed fish and wild pink salmon smolts.

Among the findings in its analysis, the Council noted the following:

> *While scientific certainty is not absolute, European research does indicate that sea lice abundance can be associated with salmon farming. Given this evidence, combined with the presence of sea lice on Broughton Archipelago pink salmon smolts, and the fact that the decline in numbers was limited to Broughton Archipelago fish, the Council believes that sea lice were associated with the decline observed in the Broughton Archipelago. Where there is a risk of serious or irreversible harm, the precautionary approach calls for action based on the best evidence available. In this Broughton Archipelago case, the absence of any evidence of some other cause than sea lice justifies action.*

The Council offered a choice of options. The preferred, lower risk option called for safe passage for migrating juvenile pink salmon by fallowing all of the fish farms in the Broughton Archipelago for the period of the seaward migration. The higher-risk option would have involved a cooperative effort including strategic fallowing, accelerated marketing of mature fish, and the application of chemotherapeutants to kill the sea lice on farmed salmon in the region.

It was somewhat heartening to the Council that both levels of government eventually took action to protect and monitor the pink salmon smolt populations in the Broughton Archipelago. While the governments did not adopt the low-risk regime of fallowing all of the farm sites, they introduced a series of other measures that they were not contemplating even a few months before. An environmental monitoring program and more extensive scientific study of sea lice were both initiated by the governments, as recommended by the Council. The shift to coastal zone management by Fisheries & Oceans Canada is also in line with the Council's recommendations.

The proof of the effectiveness or failure of the Broughton Archipelago action plans may not be fully evident for up to two years when the returning adult pink salmon migrate back. In the meantime, the results of the current pink salmon monitoring program will be closely followed by the Council.

Photo: Alexandra Morton

Lepeophtheirus salmonis (Sea Lice) on wild Pink Salmon caught near Burdwood Islands

Consultants' Report on Aquaculture

Salmon farming is proceeding in a new phase of development. The Government of British Columbia in early 2002 lifted the moratorium on salmon farm development, committing itself to an expansion of the number and distribution of salmon farms. The addition of ten to fifteen new farms per year is anticipated, and new and existing farms will be allowed into North and Central Coast areas. The need to address the wild salmon conservation issues related to salmon farming became all the more important as a result of this decision.

The bitterness and anger that have characterized the public dialogue about salmon aquaculture in British Columbia have demonstrated how polarized attitudes can become and how difficult it can be to build consensus about the future of the fisheries.

Like many public issues in this province, the debate about salmon aquaculture has provoked strong emotional reactions rather than informative discussion. The clash of opposing views has been amplified by the media coverage that dwells on the points of conflict and generally ignores those where consensus may exist. The atmosphere of accusations and contradictions in most discussions about salmon aquaculture in British Columbia has tended to hinder any progress towards resolving both genuine and perceived problems.

In July 2002, Council members decided that some ways had to be found to break the stalemate of accusations and denials about salmon aquaculture. It was decided that the debate lacked basic information and an unbiased attempt to separate fact from fiction.

The Council asked Dr. Julia Gardner and David Peterson to produce a background paper based on an examination of the assumptions and scientific information supporting the divergent arguments about salmon aquaculture. It was meant to deepen public understanding about the actual and potential impacts of salmon aquaculture on wild salmon, with a focus on that interaction in three main areas: disease and fish health, escapes and habitat impacts.

The report authors explained their approach:

> *The ideal solution to the polarization and conflict associated with the salmon aquaculture debate would be convergence of opinion around "the true facts". Unfortunately, our state of knowledge about the potential impacts of salmon farming on wild salmon allows few definitive declarations about where the truth really lies. Instead, we are faced with partial information, untested theories and a great deal of uncertainty. What is more,*

> *science – even very good science – can only guide, not direct, difficult decisions in risk management, because these decisions are, for the most part, value-driven.*

The essential points of the background paper revolved around risk assessment and the underlying concepts on which it is based. The authors concluded that the primary areas of risk appear to be in the consequences of interactions between farmed and wild salmon, such as sea lice transfers, and reproduction of escaped Atlantic salmon. The knowledge about the linkages between wild and farmed salmon is severely limited, and scientific research on these relationships must be pursued with greater vigour.

They ranked sea lice as the most serious and immediate fish health risk, and their evaluation showed that bacteria and viruses posed a significant but somewhat lesser risk. Their report was based upon current understanding of the issues; it included a rating of Atlantic salmon escapes, farmed Pacific salmon escapes, and habitat impacts, such as seabed and water quality. These were all found to pose a significant but lower risk than sea lice.

In addition to risk assessment, the consultants identified key aspects of the knowledge gap and suggested where research related to disease should be directed on a priority basis, and where further work related to escapes and habitat should be encouraged.

The consultants' report proved to be valuable in beginning a process of clarifying some significant facts, presenting valid information, and providing tools for the evaluation of risk related to salmon aquaculture. It served as a first step towards resolving some of the more contentious points of the salmon aquaculture debates, and the consultants did a service to everyone by conducting their investigation with credibility and the confidence of the stakeholders.

Aquaculture Advisory

Following the public release of the consultants' report on aquaculture in January 2003, the Council issued its Advisory entitled *Wild Salmon and Aquaculture in British Columbia*, putting forward five recommendations, including:

- More rigorous application of the precautionary approach;
- Initiatives by the salmon farming industry and government in research, monitoring and mitigation practices;
- Introduction of a federal government wild salmon policy that gives clear priority to wild salmon conservation;
- Adoption of area management strategies that can deal with both farmed and wild salmon and their possible interaction; and,
- Creation of a Salmon Aquaculture Forum as an innovative way to build consensus on the future of aquaculture and enable a constructive dialogue to begin resolving the controversies.

Applied research is needed to answer the important outstanding questions on interactions between wild and farmed salmon. There is very little specific information on survival rates, migration routes, mortality factors, predators, prey, and interaction factors for juvenile wild salmon in the coastal areas. This missing information about this early coastal life stage may be a key in understanding and avoiding impacts from salmon farms.

In the continuing absence of information on the migration routes and feeding areas of wild juveniles, the new and relocating salmon farms may inadvertently be placed in the wrong

locations. In the absence of reliable information related to proposed salmon farm locations and in order to evaluate the risks related to wild-farmed salmon interaction in possible migration and feeding areas, the precautionary principle should be invoked and any decisions on licensing or relocation of farms should be preceded by extensive analysis of possible impacts.

Although governments have requirements for detailed information on proposed salmon farm location, size, layout and production levels, the guidelines on siting do not require information on migration patterns of salmon smolts nor on oceanographic currents and water movement. This oversight could be significant for salmon, shellfish and other species using the area at various times of the year. A science-based analysis of existing fisheries resources should be required, and reasonable questions about salmon farm impacts on natural ecosystems, including short and long-term impacts on wild salmon and other marine species, should be fully considered.

The Council called for those leading the public debates on salmon aquaculture to adopt innovative ways to deal with one another and address the issues:

> *The debates around wild salmon and aquaculture generally reflect a lack of trust and a perceived unwillingness to engage in meaningful dialogue. In the view of the Council, a change of attitude and strategy by government officials and stakeholders is an essential first step towards rebuilding common ground in which both environmental and commercial interests can be frankly but constructively discussed and accommodated.*

Aquaculture facility Courtesy of the BC Salmon Farmers Association

House of Commons Presentation on Aquaculture

During February 2003, the House of Commons Standing Committee on Fisheries and Oceans requested the Council to give a presentation on fish farming and answer Member's questions. Gordon Ennis appeared on behalf of the Council. At that time, he emphasized the Council's call for more rigorous adherence to the precautionary approach and explained the importance of the proposed Salmon Aquaculture Forum as a way to lessen the acrimony of the public debate and enable solutions to be found.

The Committee members asked a number of questions related to the Broughton Archipelago pink salmon collapse and the consultants' report on aquaculture and wild salmon.

Government Responses to Aquaculture Advisories

In their initial responses to the Council's advisories, both governments committed to adhere in letter and spirit to the precautionary approach and pointed out that their action plans for the Broughton Archipelago contained significant elements of the research, monitoring and mitigation measures suggested by the Council. The Government of Canada is proceeding this summer with discussions on its implementation of a wild salmon policy. Fisheries and Oceans Canada advised the Council that the introduction of area management is also going ahead.

The Government of British Columbia provided a briefing for Council members on their action plans and the procedures that would trigger more specific responses where risks to wild salmon stocks might become more apparent. Both federal and provincial ministers endorsed the proposal for a Salmon Aquaculture Forum, and are proceeding with its introduction on the basis of the principles set out by the Council.

5. Resources

Focus on Value and Output

Measuring the value of investment in salmon research and rebuilding must incorporate more than an accountant's tally of today's commercial transactions and this year's government budgets. It is clear to the Pacific Fisheries Resource Conservation Council that in too many cases the salmon resource is undervalued and its significance is poorly understood by many government decision-makers as they reduce their budgets and investment in protection, enforcement, monitoring and restoration of stocks.

The evaluation procedures used by government tend to understate conservation values and give insufficient consideration to a future where wild salmon stocks and pristine habitat would be exceptionally prized. Economic models do not tend to capture the full extent of costs of species extinction and long-term effects of habitat changes that are often not reversible.

The Council will be pursuing this matter with government officials in an effort to redress the balance in assigning higher values to conservation and protection of the salmon resource, particularly in terms of habitat conditions.

At the same time, the Council itself has gone through a recent re-evaluation of its activities, and as a consequence the priorities have been re-focussed. The accountability that is demanded of all government activities is especially important for a Council of this sort that is meant to serve as a catalyst for change and adaptation of government policies.

Council Resources

The Pacific Fisheries Resource Conservation Council operates as an independent organization for purposes of providing information and advice, but is required to adhere to the highly regimented administrative and program requirements of the Government of Canada. In spite of this administrative limitation, the Council has consistently acted at arms-length, alerting governments and the public to situations that require action and providing information and advice that, at times, has involved pointed criticism of government policies and decisions.

The Council was originally to have been funded equally by the governments of Canada and British Columbia. However, only the Federal government has, so far, provided direct operating funds. That situation has meant that the organization has functioned with only half of the anticipated financial resources and, given the broad scope of its mandate, has been chronically under-funded.

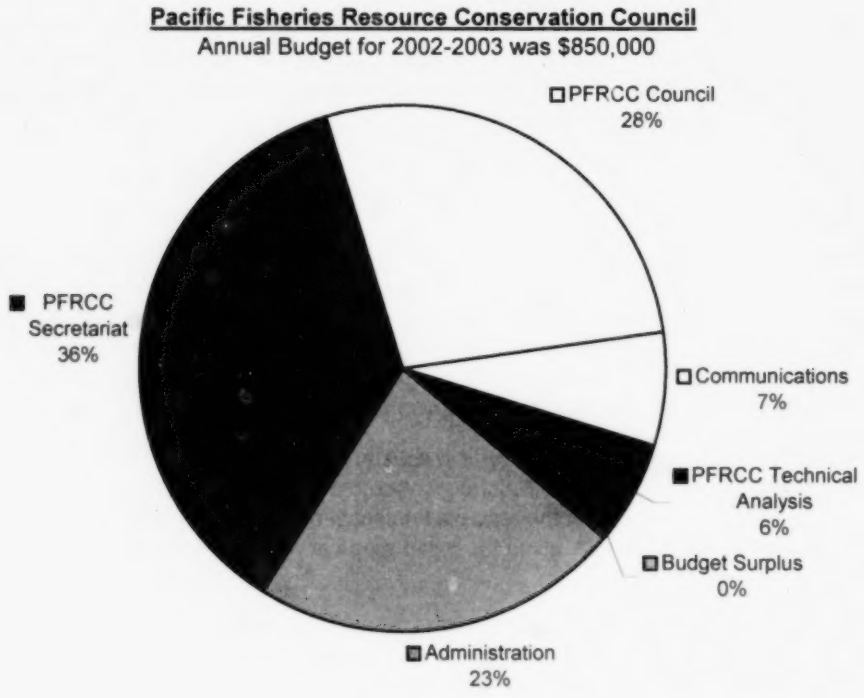
It had been intended that the Council would have a professional staff to support the work of the members. The staff would provide continuity, carry out studies, and gather information from an array of sources about the salmon resource. However, the restricted budget and requirements to adhere to federal government staffing requirements forced the Council to rely instead on a rotation of temporary staff.

The staffing arrangements have now been stabilized with highly capable individuals on secondment from Fisheries & Oceans Canada, supplemented by external specialists who assist on a consulting basis.

The Council operates with an annual budget of $850,000 provided entirely from the Pacific region budget of Fisheries & Oceans Canada. Discussions continue to take place with the BC Government about its possible provision of operating funds. At the same time, some BC Government personnel have been made available to assist in the Council's work, and the co-operation of government officials has been consistently provided in response to requests for briefings, documents and other information.

The primary expenditures of the Council are for secretariat staff, office facilities, members' expenses, research, consultations and report development. Several cost-savings were introduced last year in order to reduce reliance on external services, such as accounting and temporary employment. The result has been reorientation of the budget to carry out more public consultation and expand the Council's internet website.

An initiative that has been underway during the past year involves an extension of the Council's website as a more readily accessible and interactive information tool. The Council's intention is to make the website more interactive, informative and available to the public.



6 Appendices

Appendix 1 - Council Profile

The Pacific Fisheries Resource Conservation Council was created in September 1998. It provides advice to the Minister of Fisheries & Oceans Canada, BC Minister of Agriculture, Food & Fisheries and the Canadian public on the conservation of Pacific fish populations and the status of their freshwater and ocean habitat in British Columbia.

The Council is an independent advisory organization dealing with issues related specifically to the sustainable use of Pacific salmon stocks. It imparts information and recommendations regarding stock conservation and enhancement, as well as habitat restoration, protection and improvement.

The Council is mandated to take an ecosystem perspective on the long-term strategic priorities concerning Pacific salmon stocks and habitat, and to alert the governments to any threats to the achievement of conservation objectives. In doing so, it is also assigned the task of enhancing public understanding and support for conservation and habitat protection.

Its work involves identifying stocks at risk and in need of conservation measures, and knowledge gaps where there is insufficient information or understanding of the causes of problems affecting Pacific salmon.

In conducting its analysis, the Council is encouraged to integrate scientific information with knowledge and experience of First Nations and others involved in the fisheries and conservation activities. Its recommendations are to relate to an array of issues, including research programs, stock and habitat assessments, enhancement initiatives and government policies and practices. At the same time, the Council is not involved in in-season management or allocation decision-making.

The composition of the Pacific Fisheries Resource Conservation Council includes members with backgrounds in fisheries science, advocacy, First Nations communities, resource industry, public service, media and educational institutions.

Appendix 2 - Members and Staff

Honourable John A. Fraser, Chairman
Mark Angelo, Program Head, British Columbia Institute of Technology
Mary-Sue Atkinson, Conservationist and Environmental Advocate
Frank Brown, Ecotourism Operator
Murray Chatwin, Vice President, Ocean Fisheries Ltd.
Merrill Fearon, Executive Director, Federation of BC Writers
Dr. Paul LeBlond, Professor Emeritus, University of British Columbia
Dr. Jeff Marliave, Vice President, Vancouver Aquarium
Marcel Shepert, Program Manager, Carrier Sekani Tribal Council
Dr. Carl Walters, Professor, University of British Columbia

Dr. Richard Beamish, Senior Scientist, Fisheries and Oceans Canada (ex-officio)
Arnie Narcisse, Chairman, BC Aboriginal Fisheries Commission (ex-officio)

Gordon Ennis, Secretariat Manager
Dr. Brian E. Riddell, Scientific Advisor
Dory MacLellan, Assistant to the Chairman
Priscilla Singh, Administrator

The Council wishes to express thanks to the public servants who act as the primary liaisons on behalf of their governments: Rebecca Reid of Fisheries & Oceans Canada and Al Martin of BC Agriculture, Food & Fisheries. The Council also wishes to acknowledge the contributions of Kenneth Beeson (Public Policy Management) and John Paul Fraser (JPFco) who have served as policy and communication consultants.

Appendix 3 - Council Publications

1998-1999 Annual Report (Released June 1999)
This report and its four accompanying background papers were the first products of the Pacific Fisheries Resource Conservation Council. They were intended to present, together, a package of information and advice to governments and the Canadian public on the conservation of Pacific fish populations and habitat in British Columbia.

Freshwater Habitat (Background paper authored by Mark Angelo and Marvin Roseau, June 1999)
Abstract: Salmon and steelhead habitats in British Columbia are almost as varied as the province's geography. The rich biological diversity of species and stocks of salmonids -- the family to which salmon and steelhead belong -- is an evolutionary response to the physical and chemical variability of the habitats in which these fish live.

Coast-Wide Coho (Background paper authored by Richard Routledge and Ken Wilson, June 1999)
Abstract: Canada's management and protection of freshwater coho habitat leaves much to be desired. The effect of loss and degradation of freshwater coho habitat in the decline of southern BC coho is complex. There are very few pristine watersheds in southern BC. Loss and degradation of freshwater coho habitat is very widespread. Most biologists agree that we have lost productive coho habitat, and that habitat loss represents a significant long-term threat to wild coho production.

Fraser River Sockeye (Background Paper authored by Richard Routledge and Ken Wilson, June 1999)
This paper detailed historical trends regarding Fraser River sockeye runs. It also addressed management concerns and concludes with recommendations.

Salmon Stocks (Background Paper by Carl Walters and Josh Korman, June 1999)
Providing a broad species-by-species overview of stock status and trends for BC as a whole, this paper presented an overview of the relevant fisheries management issues associated with determining stock status. The initial aim was not to provide a detailed or complete enumeration of all local conservation issues, but rather to highlight major concerns, and to identify needs for more detailed analysis.

Climate Change and Salmon Stocks (October 1999 conference summary)
A one-day workshop, hosted by the PFRCC had a focus on: '*What is the most alarming potential impact of climate change on salmon stocks?*' and '*What is the best strategy to adopt?*'

Annual Report 1999-2000 (Released May 2000)
This *Annual Report* of the Council reviewed the state of salmon stocks and related habitat conditions, and included particular attention to a set of at-risk areas, salmon populations and habitat situations. It looked at four issues in particular — climate change, *Pacific Salmon Treaty*, salmon in the Central Coast, and strategic management.

Water Use Planning: A Tool to Restore Salmon and Steelhead Habitat in British Columbia Streams (Background paper by Mark Angelo and Marvin Rosenau, May 2000)

Abstract: Currently, many western North American heritage plants and animals are being lost due to careless use of water and this cannot be rectified until they attain preferred status for access to this important life-giving resource. Salmon and steelhead populations are among the species impacted by excessive human use of water.

Review of the Coho and Chinook Salmon Sections of the "Agreement Under the Pacific Salmon Treaty" between Canada and the United States, dated 30 June 1999 (Background paper by Randall Peterman and Brian Pyper, May 2000)

This report reviewed the "Agreement Under the *Pacific Salmon Treaty*" between Canada and the United States. The terms of reference to the authors from the PFRCC particularly focused this review on how adequately the Aggregate Abundance-Based Management rules specified in the Agreement would deal with conservation issues for Canadian coho and chinook salmon.

Sand and Gravel Management and Fish-Habitat Protection in British Columbia Salmon and Steelhead Streams (Background paper by Marvin Rosenau and Mark Angelo, May 2000)

Abstract: Sand, gravel and other sediments within and adjacent to spawning and rearing streambeds are fundamental to the productivity of salmon and steelhead stocks. The high levels of production formerly seen in many of British Columbia's chum, pink and sockeye populations were, in part, the result of the conditions of the spawning sediments, primarily gravel, available for these fish. For instance, the quality of the freshwater rearing environment for coho, chinook and steelhead is more crucial than the amount of spawning area.

State of Salmon Conservation in the Central Coa A :a (Background paper by Allan Wood, May 2000)

Abstract: Areas 6-10 of British Columbia's Central Coast were selected for study because this region provides a good measure of the current state of domestic stocks and their management. Also, this is one of the few relatively undeveloped areas left on the coast.

The Wild Salmon Policy and the Future of the Salmonid Enhancement Program (Council Advisory, June 2000)

The March 15, 2000, Wild Salmon Policy Discussion Paper was part of a series of Fisheries and Oceans Canada projects flowing from the New Directions policy initiative which was begun in October 1998 by former Fisheries Minister David Anderson. The New Directions initiative is being developed in tandem with Pacific Fisheries Adjustment and Restructuring Program. Fisheries and Oceans engaged in a round of public consultations with respect to its proposed Wild Salmon Policy, as well as the future of the Salmonid Enhancement Program, and the PFRCC provided its views in this Advisory.

Salmon Conservation in the Central Coast (Council Advisory and background paper prepared for the Council by Allan Wood, March 2001)

Abstract: The conservation status of chinook and coho salmon populations in the Central Coast has become a matter of growing concern to British Columbians. Poor returns of salmon and other important fish species have undermined the commercial and aboriginal fisheries and affected communities throughout the region. The recent work of the PFRCC has been directed towards identifying the factors that have caused these problems. Its sponsorship of this background paper was intended to provide a factual and analytical basis for the Council members to provide comments and recommendations to federal and provincial government officials. The other

purpose of the paper was to provide technical information that can enable the public to understand the situation.

A Crisis in Fisheries Education (Council Advisory, September 2001)
Abstract: Effective management of fisheries on sound conservation principles is essential if we are to maintain both biodiversity and healthy salmon stocks in British Columbia. The human resources in the fisheries sector and the skills they apply are increasingly crucial to the success of activities intended to safeguard and enhance the prospects for wild salmon.

The Role of Public Groups in protecting and Restoring Freshwater Habitats in British Columbia, with a Special Emphasis on Urban Streams (Background paper by Marvin Rosenau and Mark Angelo, September 2001)
Abstract: There has been an upsurge of community and public involvement in the protection and rehabilitation of British Columbia rivers and streams, and an evolution towards a more collective engagement in the management of these resources. This has begun to result in some remarkable successes.

Annual Report 2000-2001 (Released December 2001)
This report provides a preliminary summary of the state of stocks in 2001. It is preliminary because final spawner counts will not be available for a number of months. The report also summarizes research findings and thinking to date on the subject. Lastly, some related issues are discussed, and some important conservation and management questions are put forward.

Late-Run Fraser River Sockeye Mortality (Council Advisory Letter, January 2002)
Abstract: The 1998 brood Adams River sockeye mortality rate was 36% (850,000 sockeye), but has more recently been as high as 95% during 2000 and 2001. This letter provides recommendations to DFO on how to respond to the situation.

Potential Impacts of DFO Budget Cuts to Salmon Conservation (Council Advisory Letter, August 2002)
This letter to Fisheries & Oceans Minister Robert Thibault addresses the scenarios that might arise as a result of budget cuts to federal government fisheries enforcement, investigation and research capabilities.

Annual Report 2001-2002 (Released October 2002)
This report is innovative in assembling information that is not otherwise available to the public in any other publication. It considers Pacific salmon in four regions of southern BC: Fraser River basin; Okanagan; Strait of Georgia; and West Coast of Vancouver Island. For each region and species, the report summarizes trends in spawning population sizes since the early 1950s, explains the annual monitoring of these
populations, and identifies conservation concerns.

The Protection of Broughton Archipelago Pink Salmon Stocks (Council Advisory, November 2002)
Abstract: The European experience indicates that sea lice abundance can be associated with salmon farming. This advisory makes recommendations on how to safeguard the wild pink salmon runs of the Broughton Archipelago.

Making Sense of the Salmon Aquaculture Debate: Analysis of issues related to netcage salmon farming and wild salmon in British Columbia (Background paper by Julia Gardner and David L. Peterson, January 2003)

The report takes a look behind the debate, examines the information and assumptions supporting the arguments of opposing interests, and deepens the current public understanding about the potential impacts of salmon aquaculture on wild salmon. The report's focus was on the interplay of salmon farming and wild salmon, not all aspects of the potential impacts of salmon farming. Instead, the report concentrates on the most pressing issues pertaining to farmed salmon/wild salmon interactions.

Wild Salmon and Aquaculture in British Columbia (Council Advisory, January 2003)

This Advisory provides information and recommendations for action on the potential and perceived impacts of salmon netcage aquaculture on wild salmon and their habitat in British Columbia.

Annual Report 2002-2003 (Released June 2003)

This annual report puts forward the current findings related to stock status and habitat conditions, and it presents a summary of the Council's viewpoint on some of the most significant and immediate matters of concern. In some instances, the comments summarize and clarify the positions explained in previous Council reports. In other cases, such as salmon aquaculture, this report contains the Council's more recent consensus views.

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